2 Structure and Format

The TIGER/Line Shapefiles and associated relationship files are offered in a compressed format. One zipped file is available for each layer, with a file extension of .zip. Each zipped shapefile consists of the following five files:

- .shp – the feature geometry
- .shx – the index of the feature geometry
- .dbf – the tabular attribute information
- .prj – the coordinate system information
- .shp.xml – the metadata

Each zipped relationship file consists of the following two files:

- .dbf – the tabular attribute information
- .dbf.xml – the metadata

2.1 Shapefile Vintages

The TIGER/Line Shapefiles are available in Current, Census 2000, and Economic Census vintages to enable data users to link geography of the appropriate vintage with the data of the same vintage. For example, if the user wanted to create a map of Census 2000 information, then the user would use the Census 2000 vintage shapefiles. The following is an explanation of the vintages available in the TIGER/Line Shapefiles. Table 3.1.1 shows the vintages available for each shapefile or relationship file.

2.1.1 Current Census Geography

Current geography is defined as the latest version of the geographic extent of legally defined geographic areas as reported, generally reflecting the boundaries of governmental units in effect as of January 1, 2009, or legal and statistical area boundaries that have been adjusted and/or corrected since Census 2000. This vintage enables users to see the most current boundaries of governmental units and they will match the data from the surveys that use 2009 geography, such as the 2009 Population Estimates.

2.1.2 Census 2000 Geography

Census 2000 geography is the geographic extent of legally defined geographic areas or statistical areas in effect on January 1, 2000. This vintage enables users to work with Census 2000 data using boundaries as they existed in 2000. Since 2000, the Census Bureau initiated significant operations to improve the coordinate accuracy of our geographic database-the MAF/TIGER Accuracy Improvement Project or MTAIP. The MTAIP modified the base coordinates of virtually all the features in the database, thus the representation of Census 2000 geography will not match the representation depicted in the Census 2000 TIGER/Line files. The inventory and attributes of the 2000 census geography is, however, unchanged.

2.1.3 2007 Economic Census Geography

2007 Economic Census geography is defined as the version of the geographic extent of legally defined geographic areas in effect on January 1, 2007. The Economic Census is the major economic statistical program of the United States, and it provides a detailed portrait of the nation's economy once every five years. The geographic entities used in an Economic Census can differ from those used in decennial censuses. The boundaries used for geographic entities for the 2007 Economic Census are those reported to the Census Bureau through the Boundary and Annexation Survey (BAS) to be legally in effect on January 1, 2007.

Table 1: 2009 TIGER/Line Shapefile Layers Availability by Vintage

Layer	2000	Current	Economic Census
108th Congressional District (Congress elected in 2002)	X		
111th Congressional District (Congress elected in 2008)		X	
3-Digit ZIP Code Tabulation Area	X	2002*	
5-Digit ZIP Code Tabulation Area	X	2002*	
Address Ranges Relationship File#		X	
Address Range-Feature Name Relationship File #		X	
Alaska Native Regional Corporation	X	X	
All Lines #		X	
American Indian/Alaska Native/Native Hawaiian Area	X	X	
American Indian Tribal Subdivision	X	X	
Area Hydrography #		X	
Area Landmark		X	
Block Group	X		
Census Block	X	X	
Census Tract	X		
Combined New England City and Town Area		X	
Combined Statistical Area		X	
Commercial Region			X
Consolidated City	X	X	**
County and Equivalent Entity	X	X	X
County Subdivision	X	X	
Elementary School District	X	X	
Feature Names Relationship File #		X	
Metropolitan Division		X	
Metropolitan/Micropolitan Statistical Area		X	
Military Installation #		X	
New England City and Town Area		X	
New England City and Town Area Division		X	
Other Identifiers Relationship File #		X	
Place	X	X	X
Point Landmark #		X	
Public Use Microdata Area	X		
Secondary School District	X	X	
State and Equivalent Entity	X	X	X
State Legislative District—Lower Chamber	X	X	
State Legislative District—Upper Chamber	X	X	
Subbarrio	X	X	
Super Public Use Microdata Area	X		
Topological Faces (Polygons With All Geocodes) Shapefile #		X	
Topological Faces-Area Hydrography Relationship File #		X	
Topological Faces-Area Landmark Relationship File #		X	
Traffic Analysis Zone	X		
Unified School District	X	X	
Urban Areas	X	CORRECTED 2000***	
Urban Growth Areas	X	X	
Voting District	X		

* An updated version of the ZCTAs reflecting a 2002 vintage is the most current file available.
** The Economic Census vintage shapefile for Consolidated Cities is unavailable for 2009; users needing this data should use the 2008 shapefiles.
*** This file contains corrections to the Census 2000 urbanized areas and urban clusters. These corrections were announced in 2002, and are the official urban areas for Census 2000. For more information, please see the "Urban Areas" section in Chapter 4.
# The TIGER/Line Shapefiles and relationship files for base features always only shows the most current information in the MAF/TIGER database. These base features (including address range) are not stored as vintage data. Changes from the representation, inventory, and attributes of these features can only be determined by comparing the different annual TIGER/Line files and/or shapefiles.

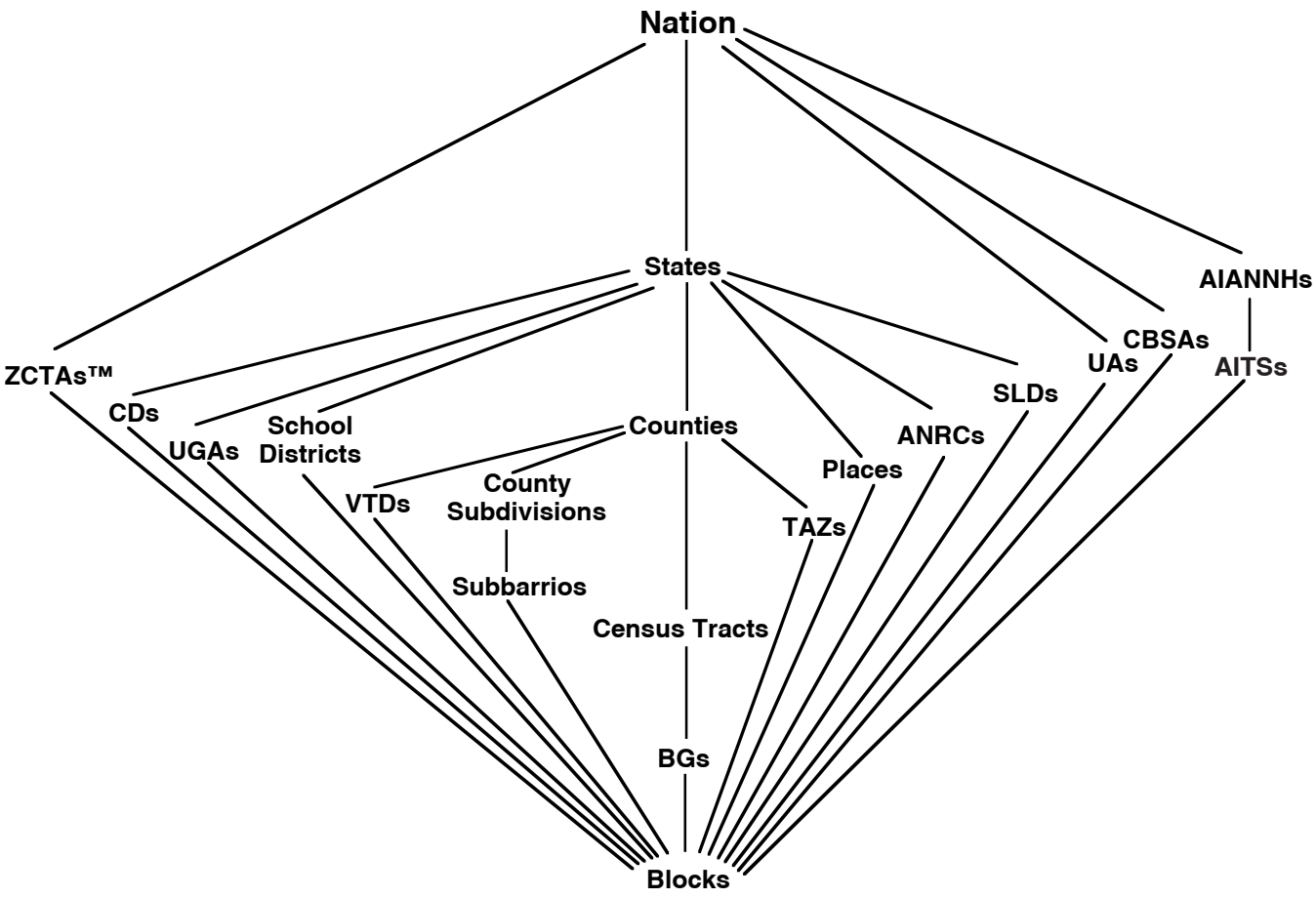
2.2 Organization of the Files

Geographic entities included in the Census Bureau's tabulations are generally hierarchical. The organizational structure of the TIGER/Line Shapefiles is based on this hierarchical framework. Figure 1 shows the progression of geographic areas from the nation to the block level.

Shapefiles are released in one of four types of hierarchical coverage—American Indian area-based, nation-based, state-based, or county-based. Some shapefiles are released in multiple coverages to enable flexibility in downloading files. Below are descriptions of each coverage. Table 2 provides an overview of which file types are available by each hierarchical coverage.

- **American Indian area-based files**—Entities that are defined within American Indian areas (AIA), are available in AIA-based shapefiles.
- **Nation-based files**—Entities that are defined independently of and can extend across the boundaries of states and counties, such as urban areas, are available in national shapefiles encompassing the United States, Puerto Rico and Island Areas. In addition, selected geographic entities that are defined by state, such as counties, are available as a nation-based coverage in addition to a state-based coverage.
- **State-based files**—Entities such as school districts and congressional districts that are defined within states and can cross county boundaries are represented in state-based shapefiles. In addition, many national files are available at the state-level. For example, a new state-based shapefile will contain all of the metropolitan and micropolitan statistical areas (generically referred to as core based statistical areas—CBSAs) that are wholly contained within the state or the portion of the CBSA contained within that state. In addition, selected geographic entities that are defined by county, such as census tract, are available as a state-based coverage in addition to a nation-based coverage.
- **County-based files**—Entities that are defined within counties and do not cross county or state lines such as census tracts and voting districts are represented in county-based shapefiles. In addition, the shapefiles that contain roads, railroads, and other linear features as well as the relationship files are available by county.

Figure 1 ***Hierarchical Relationship of Geographic Entities***



AIANNH: American Indian, Alaska Native, and Native Hawaiian area
AITS: American Indian Tribal Subdivision
ANRC: Alaska Native Regional Corporation
BG: Block Group
CD: Congressional District
CBSA: Core Based Statistical Area (Metropolitan and Micropolitan Statistical Areas)
SLD: State Legislative District
TAZ: Traffic Analysis Zone
UA: Urban Area
UGA: Urban Growth Area
VTD: Voting District
ZCTA™: ZIP Code Tabulation Area

Table 2: 2009 TIGER/Line Shapefile Layers Availability, by Parent Geography

Layer	Nation- Based Files	State-Based Files	County- Based Files	American Indian Area-Based Files
108th Congressional District (Congress elected in 2002)		X		
111th Congressional District (Congress elected in 2008)		X		
3-Digit ZIP Code Tabulation Area	X	X		
5-Digit ZIP Code Tabulation Area	X	X		
Address Ranges Relationship File			X	
Address Range-Feature Name Relationship File			X	
Alaska Native Regional Corporation		X		
All Lines			X	
American Indian/Alaska Native/Native Hawaiian Area	X	X		
American Indian Tribal Subdivision	X	X		X
Area Hydrography			X	
Area Landmark			X	
Census Block		X	X	
Block Group		X	X	
Census Tract		X	X	
Combined New England City and Town Area	X	X		
Combined Statistical Area	X	X		
Commercial Region		X		
Consolidated City		X		
County and Equivalent Entity	X	X		
County Subdivision		X	X	
Elementary School District		X		
Feature Names Relationship File			X	
Metropolitan Division	X	X		
Metropolitan/Micropolitan Statistical Area	X	X		
Military Installation	X	X		
New England City and Town Area	X	X		
New England City and Town Area Division	X	X		
Other Identifiers Relationship File			X	
Place		X		
Point Landmark			X	
Public Use Microdata Area		X		
Secondary School District		X		
State and Equivalent Entity	X	X		
State Legislative District-Lower Chamber		X		
State Legislative District-Upper Chamber		X		
Subbarrio (Sub-Minor Civil Division)			X	
Super Public Use Microdata Area		X		
Topological Faces (Polygons With All Geocodes) Shapefile			X	
Topological Faces-Area Hydrography Relationship File			X	
Topological Faces-Area Landmark Relationship File			X	
Traffic Analysis Zone			X	
Unified School District		X		
Urban Areas	X			
Urban Growth Area		X		
Voting District			X	

2.3 File Naming Conventions

The name of each file is:
File Name: tl_2009_<*extent*>_<*layer*>.<*ext*>

Where:
tl = TIGER/Line

2009 = the version of the files

<*extent*> = parent geography entity ID code (variable length of two to five characters)

The entity ID code identifies the geographic extent by specific entity for which the file contains data. It is of variable length depending on the type of file:

American Indian area-based:	4-digit American Indian area census code
Nation-based:	2 characters, "us"
State-based:	2-digit numeric state FIPS code
County-based:	5-digit numeric state-county FIPS code

<layer> = layer tag of variable length

The layer tag specifies the type of geography or feature the file contains. If "00" appears at the end of the layer tag, the file contains Census 2000 geography. If "ec" appears at the end of the layer tag, the file contains Economic Census geography. If neither "00" nor "ec" appears, the file contains current geography.

<*ext*> = the file extension

Examples:

American Indian area-based shapefile: Census 2000 American Indian Tribal Subdivision shapefile for Bois Forte Reservation
File Name: tl_2009_0335_aitsaia00.shp

National shapefile: Current New England City and Town Area (NECTA) shapefile
File Name: tl_2009_us_necta.shp

State-based shapefile: Economic Census County and Equivalent shapefile for Maryland
File Name: tl_2009_24_countyec.shp

County-based shapefile: Census 2000 Block shapefile for Worcester County, MA
File Name: tl_2009_25027_tabblock00.shp

2.4 Terminology

Edge—Refers to both visible and non-visible linear topological primitives. An edge extends from a designated start node and continues to its end node. The order of these nodes determines the from-to orientation and left/right sides of the edge.

Face—Refers to areal (polygon) topological primitive lines. A face is bounded by one or more edges; its boundary includes not only the edges that separate it from other faces, but also any interior edges contained within the area of the face.

MAF/TIGER Feature Class Code (MTFCC)—The MTFCC is a 5-digit code intended to classify and describe geographic objects or features. The MTFCC replaced the Census Feature Class Code (CFCC) used before 2007 and was expanded to include features that previously did not have codes. MTFCC definitions are available in the metadata files that accompany each shapefile and relationship file and in Appendix F of this document. A crosswalk between CFCC and MTFCC codes can be found on the TIGER/Line website (http://www.census.gov/geo/www/tiger).

Node—Refers to a point location representing a point in space defined by a coordinate pair. A node can be associated with one or more edges (a connected node), either as the end point of an edge in space or as the intersection point between one or more other edges. A node can also represent a point feature that is not connected to any edge (an isolated node).

Relationship file—The TIGER/Line relationship files are extracts of selected geographic information from the MAF/TIGER database. Each TIGER/Line relationship file can stand alone as an independent dataset but is designed to be used jointly with the shapefiles to join additional attributes and data to the spatial features.

Shapefile—A shapefile is a digital vector storage format for storing geometric location and associated attribute information.

2.5 Datum

Each shapefile contains a .prj file that contains the GIS industry standard well-known text (WKT) format to describe the coordinate system/projection/datum information for each shapefile. This enables users to easily import the shapefiles into their local coordinate system. All Census Bureau generated shapefiles are in Global Coordinate System North American Datum of 1983 (GCS NAD83). Each .prj file contains the following:

GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137,298.257222101]],PRIMEM["Greenwich",0],UNIT["Degree",0.0174532925199433295]]

2.6 Metadata

Metadata are an organized data file used to capture the basic descriptive characteristics about data. For example, metadata will describe the quality, purpose, spatial extent, and history of a particular dataset.

A metadata file in XML (Extensible Markup Language) format is provided along with each shapefile and relationship file. Metadata files associated with shapefiles have the extension .shp.xml, and those associated with relationship files have the extension .dbf.xml. The metadata files comply with Federal Geographic Data Committee (FGDC) standards and can be read in any text editor. Please note that In order to see all the metadata element values, the 'FGDC Classic ' stylesheet must be specified when using ESRI's ArcCatalog.

The TIGER/Line Shapefiles metadata contain an entity and attribute information section. The entity and attribute information provide a detailed description of the TIGER/Line Shapefiles and relationship files that include publication date, contact information, and all of the possible valid values for an attribute and each value's meaning. There will be one entity section for each shapefile and relationship file. Users should refer to the metadata files for extensive documentation about the contents of the shapefiles and relationship files.

In addition, the All Lines Shapefile also contains a Spatial Metadata Identifier (SMID), which identifies the source of the coordinates for each edge and provides the link between the TIGER/Line Shapefiles and the source and horizontal spatial accuracy information. Refer to the metadata for each county or equivalent entity for information on the source for each edge and the horizontal spatial accuracy, where known. Please note that the horizontal spatial accuracy, where reported, refers only to those edges identified as matched to the source with that accuracy. It is not the spatial accuracy of the TIGER/Line Shapefile as a whole. For more information regarding the All Lines Shapefile please refer to Section 4.4, All Lines, Spatial Accuracy of Linear Features (pg. 4-20).

TIGER/Line Shapefiles are a product of the U.S. Census Bureau and as such contain metadata that comply with two standards: the Census Bureau Geospatial Product Metadata Standard (GPMS), and the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM). The Census Bureau created the Geospatial Product Metadata Standard (GPMS) which includes metadata elements from the FGDC CSDGM and the International Organization for Standardization (ISO) metadata standard: ISO 19115.